

to remove gums, olefines, and other stray constituents. The clay was room-conditioned to 30° and 70 per cent relative humidity.

TABLE 2.—DENSITIES OF HIGHLY ACTIVE CLAY

	At room conditions	Dried at 160°C.	Product after heating to 800°C.
Mean grain density in chlorex	2.2322	2.4218	2.3841 gm/cc.
Mean grain density in water	2.0249	2.4304	2.6504 gm/cc.
Mean grain density in gasoline	2.2242	2.4508	2.3915 gm/cc.
Observed relative weights	1.1623	1.0739	1.0000
Calculated relative volumes	1.2414	1.0571	1.0000

At room conditions this clay held a large amount of water on grain surfaces, but at 160° the greater part of this water had been driven off. The ignited clay had evidently lost practically all of its internal or essential water. Gasoline was adsorbed a little, as compared with chlorex, on the ignited sample but was adsorbed considerably more on that conditioned at 160°. This clay turned a dark brown in a few minutes owing to cracking and to adsorption of cracked portions of the gasoline. An adsorbed layer of gasoline 0.1 μ deep on this clay would add about 5 mg. per gram of clay. The decreased density at 800° indicates loss of essential water, and possibly some sintering.

The pycnometer method may be used to study adsorption but it is tedious and troublesome and less satisfactory than direct first-order methods. However, the pycnometer may become a useful tool of research in investigating changes in grain volume on hydration and dehydration, in distinguishing between internal and external water, and in determining pore size in dehydrated crystals.

BOTANY.—*New and noteworthy mosses from Jamaica.*¹ EDWIN B. BARTRAM, Bushkill, Pennsylvania.

The very extensive moss collections made by C. R. Orcutt during his residence in Jamaica during the years 1927–1929 have provided the material for the following list. The record includes only descriptions of the new species, along with pertinent notes on unusual species that are either rare or new to the island.

During his stay in Jamaica Mr. Orcutt sent me parcels of small specimens from time to time, which were determined and reported upon. After his untimely death in Haiti in 1929 his enormous collections were sent to the United States National Museum. The mosses were subsequently segregated and transmitted to me for study. The

¹ Received August 15, 1935.

task of organizing and labelling such a mass of material has proved an onerous one. With the idea of making available the more important information, I have prepared the present paper. The type collections of the new species are in the United States National Herbarium and my own herbarium.

I am grateful to Dr. W. R. Maxon for his help in separating the mosses from the general collection of lower cryptogams with which they were mixed, and also for a nearly complete record of localities and dates which provides data for numerous collections that otherwise would have been of little value.

FISSIDENTACEAE

Fissidens (*Aloma*) *imbricatus* E. G. Britt. & Bartr., sp. nov. Fig. 1.

Autoica. Caules gregarii vel dense caespitosi, 5–10 mm. alti, contorti, ramosi, densifolii. Folia dense imbricata, rigida, superne anguste lanceolata,

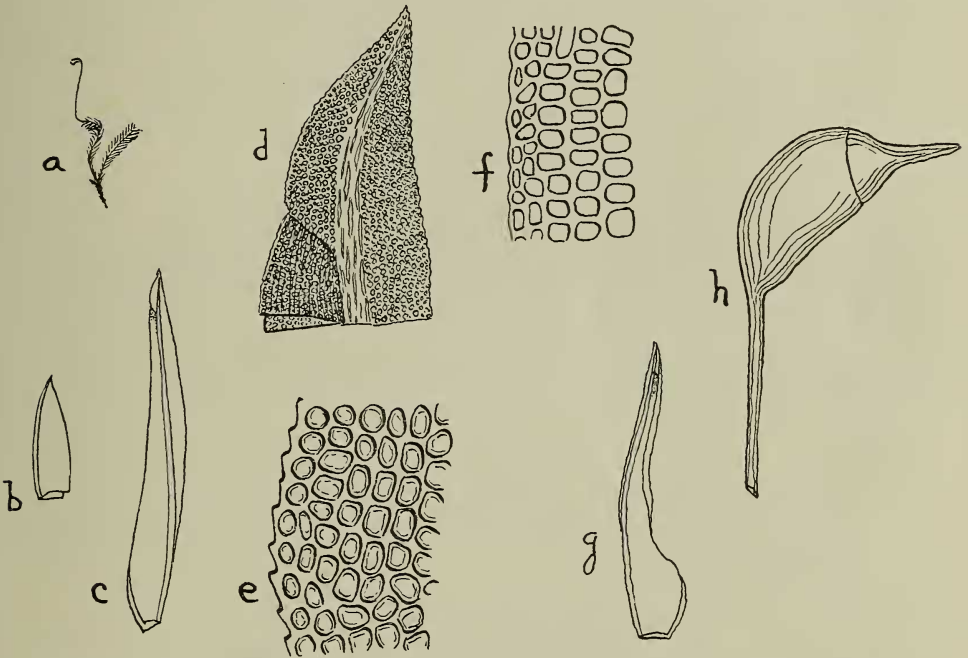


Fig. 1.—*Fissidens imbricatus* E. G. Britt. & Bartr., sp. nov.: a, plant $\times 1$; b, lower leaf $\times 22$; c, upper leaf $\times 22$; d, apex of upper leaf $\times 160$; e, cells of apical blade and margin $\times 400$; f, cells of duplicate blade and margin $\times 400$; g, perichaetial leaf $\times 22$; h, capsule $\times 22$.

acuta, ad 2 mm. longa; lamina dorsalis angustissima, supra basin enata, inferne minuta; costa subflexuosa, percurrens; margines ubique elimbati, minute crenulati; cellulae superiores hexagonae, circa 10μ , turgidae, parietibus incrassatis, marginales minores, basiales majores, laevissimae, ad 16μ . Seta geniculata, rubra, ad 9 mm. longa; theca inclinata vel arcuata, asym-

metrica, deoperculata circa 0.75 mm. longa; operculum rostratum; peristomii dentes 0.33 mm. longi, fissi; sporae laevissimae, 10–13 μ .

TYPE: Schwallenburgh, St. Anne's Parish, Dec. 8, 1927. *C. R. Orcutt* 3942a.

Similar to the rare *F. petrophilus* Sull., but differing in the curled and recurved proliferous stems, longer setae, and inclined or arcuate capsules.

DICRANACEAE

Campylopus Oerstedianus (C.M.) Mitt.

Blue Mountain Peak, nos. 5378 and 5380c.

These collections correspond very well with the description of this species in having the costa merely ribbed on the back and in the poorly developed alar cells. As the ubiquitous *C. introflexus* is a strongly composite species, with innumerable variations, I cannot help feeling somewhat skeptical about the validity of *C. Oerstedianus* as a specific concept.

CALYMPERACEAE

Syrrophodon ligulatus Mont.

Vicinity of Arntully, Nov. 1, 1928, no 6784a. New to Jamaica.

POTTIACEAE

Anoetangium incrassatum Broth.

Vicinity of Arntully, nos. 2779, 3116, 3872, 6755, 6995; Moy Hall, no. 6888; Abbey Green, alt. 5000 ft., on bank; vicinity of Farm Hill, no. 3420. A distinct endemic species which seems to be fairly common, to judge from number of collections.

Hymenostylium glaucum (C.M.) Broth. var. *cylindricum* Bartr. var. nov.

Theca anguste cylindrica, leniter curvata, saepe microstoma, aetate nigrescens.

TYPE: Concrete wall, Farm Hill Works, May 3, 1928, *C. R. Orcutt* 5461.

The cylindric capsules in this variety are noticeably different from the short, ovoid capsules of the typical form. Both are abundantly represented from numerous localities.

Trichostomum sublamprothecium Par.

Moy Hall, no. 6880; vicinity of Arntully, nos. 6791, 7066; Abbey Green, nos. 5170a, 5249a; Farm Hill Works, no. 5455b. The collections grouped here are all similar in having the peristome teeth deeply inserted and free below (not united in a basal membrane as in *T. jamaicense*). The setae are yellow.

Tortella mollissima Broth. (ined.)

Near Sweetwater, St. James' Parish, nos. 2199a, 2201. This species is not included in the Pflanzenfamilien, and is evidently undescribed. It was

found named in a series of mosses collected by C. A. Purpus near Zacuapan, Mexico, which was sent to me from the University of California. Subsequent records from Cuba and Guatemala indicate that it has a rather wide distribution in the Caribbean regions.

***Barbula orizabensis* C.M.**

Barbula recurvicauspis C.M.

Vicinity of Arntully, no. 6900.

This collection is representative of a considerable series from various localities. It is identical in every way with *B. orizabensis* from Mexico. I have not seen the type of *B. recurvicauspis*, but there is surely nothing in the description to indicate any distinction.

***Desmatodon Sprengelii* (Schwaegr.) Williams**

Balaclava, on concrete wall, no. 625a; Phillip's Field, on bank, no. 1840a; near Kingston, on limestone, Feb. 12, 1927; along Black River, on earth, no. 7551.

New to Jamaica. This neat little moss, previously known only from the Dominican Republic and Florida, is an interesting addition to the Jamaican flora.

***Aloinella apiculata* Bartram, sp. nov.**

Fig. 2.

Dioica; caespitosa, caespitibus densiusculis, fusciscentibus. Caulis brevis-simus, dense foliosus, simplex. Folia sicca incurvo-adpressa, humida erecto-patentia, rigida, e basi brevi lingulata, sensim acuta, apiculata, ad 2 mm. longa, marginibus inferne erectis, superne late inflexis, prope apicem denticulatis; costa applanata, dorso superne grosse papillata, ventre dense filamentosa; cellulae basiales rectangulares, parietibus fusciscentibus, superiores irregulariter transverse-elongatae, parietibus incrassatis. Folia perichaetialia minora, marginibus erectis, costa angustiori, sparse filamentosa; seta 10–12 mm. longa, rubra, laevissima; theca erecta, cylindrica, fusca, deoperculata 2 mm. longa; peristomii dentes breves, pallidi, erecti, dense papilloso, fere ad basin divisi, hic illic constricti, corona basilari ad 70μ alta; operculum conico-rostratum, 1.5 mm. longum; annulus 0; sporae 8–10 μ fuscidulae, laevissimae.

TYPE: Vicinity of Arntully, Nov. 1, 1928, *C. R. Orcutt*, 6802. Very distinct from *A. catenula* Card., of Mexico, in the leaf apex, which is apiculate by the excurrent costa (not rounded and helmet-shaped).

ORTHOTRICHACEAE

***Zygodon Reinwardtii* (Hornsch.) A. Br.**

Blue Mountain, no. 3166. New to Jamaica. The range of this species in North America, as given in Malta's monograph (5), is limited to Mexico. This seems to be the only record of both the species and the genus in the West Indies.

CRYPTHAEACEAE

Acrocryphaea Coffeae (C.M.) Par.

Newmarket, nos. 7277 and 7332; Darliston, no. 6218. New to Jamaica.

PTEROBRYACEAE

Pirella filicina (Hedw.) Card.

Vicinity of Arntully, no. 7062; Stony Valley River Gully, no. 5891. Apparently an uncommon species. It is sometimes difficult to separate from

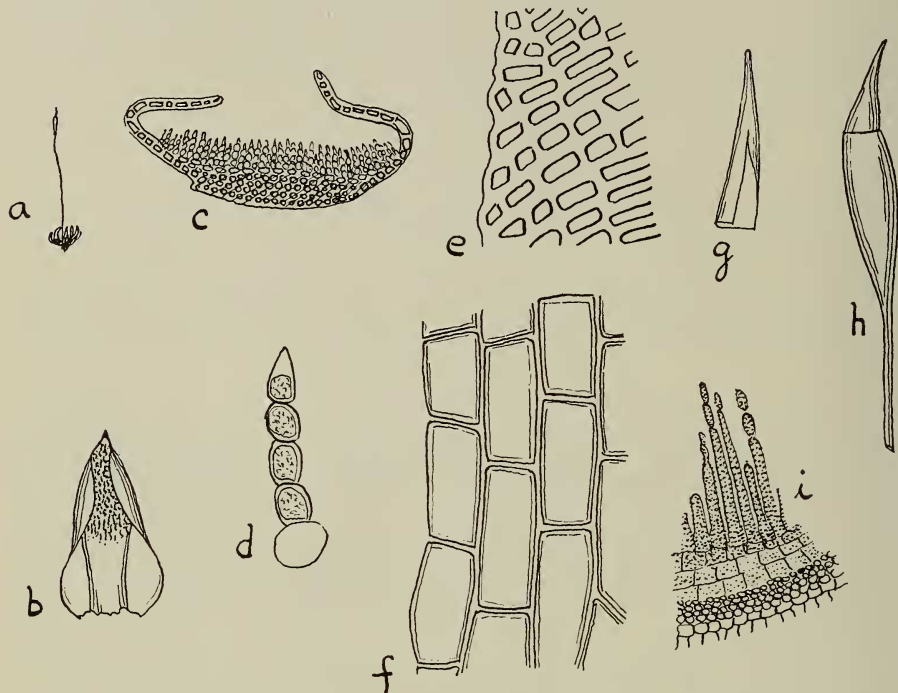


Fig. 2.—*Aloiinella apiculata* Bartr., sp. nov.: a, plant $\times 1$; b, leaf $\times 16$; c, upper part of leaf in cross section $\times 80$; d, costal filament $\times 400$; e, upper leaf cells and margin $\times 400$; f, basal leaf cells $\times 400$; g, calyptra $\times 9$; h, capsule $\times 9$; i, part of peristome $\times 160$.

Pterobryum angustifolium, but usually may be distinguished by the broader, more ovate branch leaves, which are deeply excavate under the apex, and by the shorter, oval cells of the upper part of the leaf. The leaves are also more inclined to be wrinkled and rugose when dry.

Pirella cavifolia (Card. & Herz.) Card.

Vicinity of Arntully, nos. 2764a and 5680a; Stony Valley River Gully, no. 5894. An interesting addition to the Jamaica flora. Previously known only from the type locality in Vera Cruz, Mexico.

METEORACEAE

Pipillaria imponderosa (Tayl.) Broth.

Vicinity of Arntully, no. 2767; Blue Mountain Peak, no. 5305; Morce's Gap, no. 5573; Stony Valley River Gully, no. 5895. New to Jamaica.

Aerobryopsis longissima (Doz. & Molk.) Fleisch.

Aerobryopsis mexicana Card.

Vicinity of Arntully, no. 2832a. New to Jamaica. This collection is typical of the species in all respects. I am therefore well content to follow Cardot's opinion (3, 4) that *A. mexicana* and *A. longissima* are conspecific. Apparently *A. longissima* is exceedingly rare in North America, and known only from a single collection in Mexico and the one listed above from Jamaica.

NECKERACEAE

Homalia glabella (Hedw.) Mitt.

Moy Hall, no. 6832. A frequent species. The sporophyte characters have not, I think, been noted. The following description was made from plants in good fruit:

Seta slender, red, about 14 mm. long; capsule inclined, short-ovoid, 1.75 mm. long; lid conic-rostrate, oblique, as long as the urn; peristome teeth finely cross-striate, basal membrane of inner peristome about $\frac{1}{3}$ the height of the teeth, segments equalling the teeth, keeled, widely split along the median line, cilia one, appendiculate; spores smooth, 10–13 μ .

Pinnatella jamaicensis Bartr.

Since the publication of this species (1) I have had an opportunity to compare the Jamaica plants with a specimen of *P. piniformis* (Brid.) named by Bescherelle (*Duss* 342 from Guadeloupe). That they are clearly distinct is unquestionable. The broadly rounded branch leaves of *P. jamaicensis* are in bold contrast to the sharply acute branch leaves of *P. piniformis*.

PILOTRICHACEAE

Pilotrichidium callicostatum (C.M.) Besch.

Many of the numerous collections of this species are from aquatic or subaquatic habitats to which the plants seem to be especially partial.

Diploneuron Bartr., gen. nov.

Pilotrichidia Besch. forsan affine, sed costis finis ad apicem folii in subulam longam acutam confluentibus.

Diploneuron connivens Bartr., sp. nov.

Fig. 3.

Dioicum?; caespitosum, caespitibus sat densis, viridibus, haud nitidis. Caulis repens, hic illic radiculosus, irregulariter ramosus, ramis ad 1 cm. longis. Folia sicca erecto-patentia, saepe flexuosa, humida horride patula, e basi brevi oblongo-lanceolata, concava, acuminata, 3–4 mm. longa,

marginibus erectis, ubique minutissime crenulatis; costae binae prope medium folii, superne marginales, ad apicem in acumen attenuatum subulatum confluentes; cellulae superiores irregulares, saepe elongatae, parietibus incrassatis, sinuosis, circa 5μ latae et $12-25\mu$ longae, hic illic bistratosae, basilares latiores, laxae, alares haud distinctae. Folia perichaetialia erecta, ad 2.5 mm. longa, caulinis sat similia sed cellulis basilaribus laxioribus,

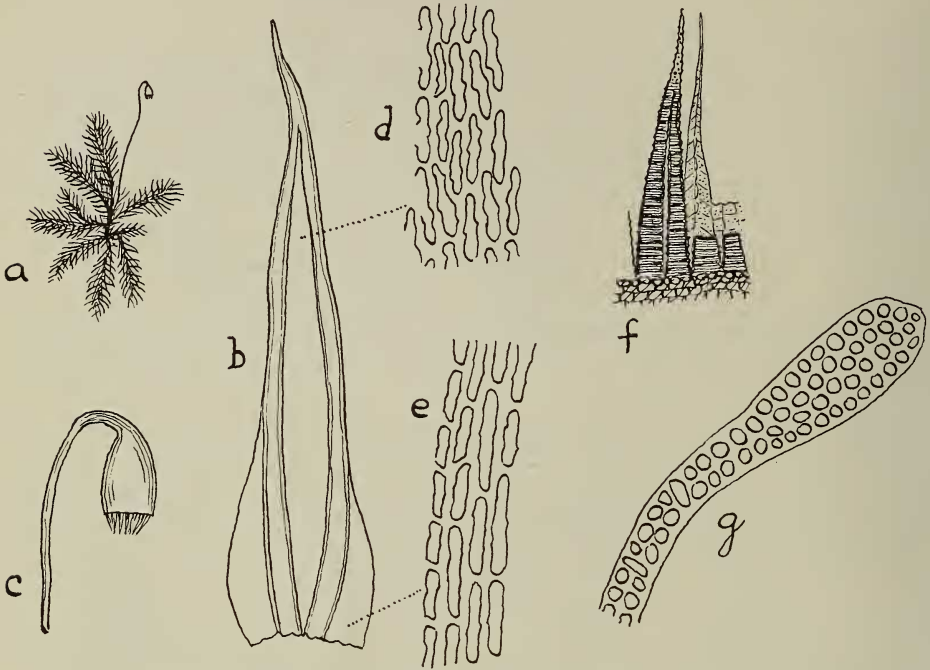


Fig. 3.—*Diploneuron connivens* Bartr., sp. nov.: a, plant $\times 1$; b, leaf $\times 24$; c, capsule $\times 9$; d, upper leaf cells $\times 400$; e, basal leaf cells $\times 400$; f, part of peristome $\times 80$; g, margin of upper part of leaf in cross section $\times 400$.

rectangularibus, hyalinis; seta circa 2 cm. longa, laevissima, rubra; theca nutans, oblonga, fusca, 1.5 mm. longa; peristomium magnum, dentibus fuscis, trabeculatis, linea media exaratis, endostomio luteo, processibus carinatis, papillois; calpytra sporogonii immaturi pallida, sparse pilosa; spores laevissimae, $12-14\mu$.

Lumsden, St. Ann's Parish, 1928, *C. R. Orcutt* 6087 (type); Schwallenburgh, St. Ann's Parish, no 3942b.

I know of no other moss in which the costae become marginal in the upper half of the leaf and coalesce at the apex in a thickened, subulate point. Although similar to *Pilotrichidium* in sporophyte characters, the new genus is clearly unique in leaf structure.

In commenting upon this plant my friend M. Thériot suggested that it might be placed in the Pilotrichaceae. I feel that this is based on sound judgement and have adopted the suggestion, rather than follow my first inclination to include the genus in Hookeriaceae.

HOOKERIACEAE

Lepidopilum Mulleri (Hampe) Mitt.

Booby Woods, Moy Hall, nos. 6876 and 6930; vicinity of Arntully, no. 5774. New to Jamaica.

THUIDIACEAE

Anomodon Wrightii C.M.

Vicinity of Arntully, no. 3840. The above is the only gathering of this species that I know of since the original collection in Cuba by Wright. The slender, julaceous branches and entire leaves may be constant characters, but it comes uncomfortably close to *A. attenuatus* (Hedw.) Huben.

Anomodon rostratus (Hedw.) Schp.

Vicinity of Arntully, no. 3185; Westphalia (Cedar Hurst), no. 3762; Blue Mountain, no. 2854. New to Jamaica.

Thuidium minutulum (Hedw.) Bry. eur.*Thuidium Wrightii* Jaeg.

Moy Hall, no. 6892; vicinity of Farm Hill, no. 3671. Abundantly represented in Jamaica by numerous collections in rich fruit. The two numbers listed above are representative. I fail to find any distinguishing characters at all in *T. Wrightii* Jaeg. Like *Anomodon rostratus*, *Campyllum chryso-phyllum*, and *Tortula agraria*, the range of *T. minutulum* (Hedw.) includes the southeastern United States, Cuba, and Jamaica.

AMBLYSTEGIACEAE

Platyhypnidium aquaticum (Hampe) Fleisch.

Stony Valley River Gully, no. 5877. New to Jamaica.

BRACHYTHECIACEAE

Scleropodium purum (Hedw.) Limp.

Cinchona, 1928, no. 5492c. Apparently introduced from Europe.

Rhynchostegium argute-serratum Bartr., sp. nov. Fig. 4.

Autoicum, gracilescens, caespitosum, caespitibus densis, depressis, viridibus, nitidiusculis. Caulis elongatus, parce fusco-radiculosus, repens, irregulariter pinnatim ramosus, ramis patulis, haud complanatis, cum foliis ad 2 mm. latis, breviter attenuatis. Folia ramea patula, ovato-lanceolata, acuminata, concaviuscula, ad 1 mm. longa marginibus basi leviter recurvis, superne erectis, ubique argute serratis; costa supra medium folium parum superans; cellulae superiores rhomboideo-lineares, circa 7–8 μ latae, laevis-simae, basin versus laxiores, alares haud distinctae. Folia perichaetialia erecto-appressa; seta tenuis, laevis-sima, rubra, circa 1.5 cm. longa; theca oblonga, inclinata, 1.3 mm. longa, sub ore constricta, aetate nigrescens, exothecii rete laxo, e cellulis rectangularibus, peristomium typicum; operculum e basi conica longe et oblique subulatum; sporae laevis-simae, 15 μ

Farm Hill, no. 3749a; Moy Hall, no. 6875; Booby Woods, Moy Hall, nos. 6957, 6962 (type).

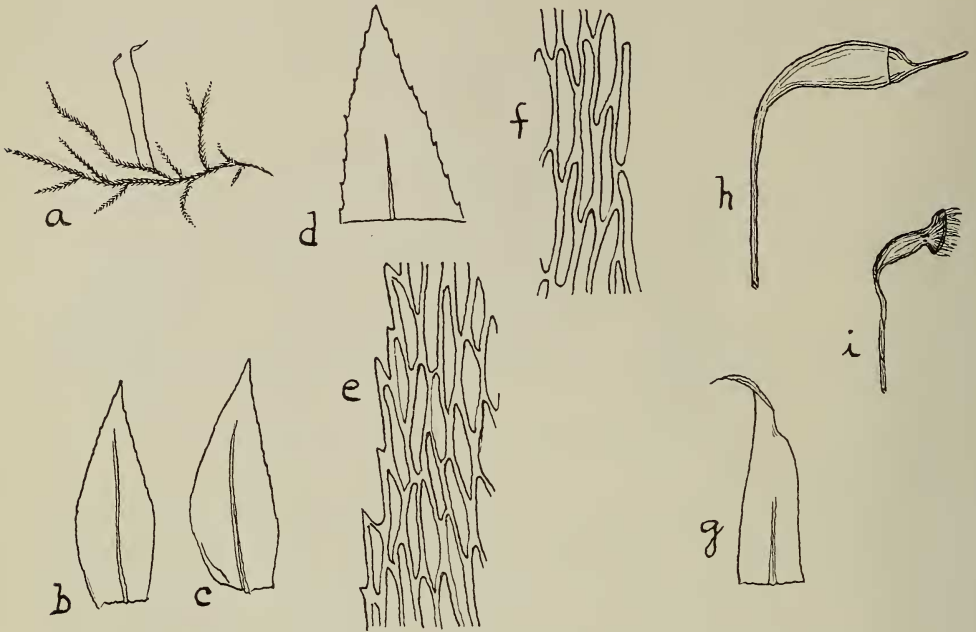


Fig. 4.—*Rhynchoszegium argute-serratum* Bartr., sp. nov.: a, plant $\times 1$; b, c, leaves $\times 30$; d, apex of leaf $\times 80$; e, upper leaf cells and margin $\times 400$; f, basal leaf cells $\times 400$; g, perichaetial leaf $\times 30$; h, moist capsule $\times 9$, i, dry capsule $\times 9$.

A rather slender, delicate species for the genus. It may be distinguished from *R. scariosum* (Tayl.) by the vivid green color, less finely pointed leaves, shorter areolation, and sharply serrate margins. The deep red setae are also characteristic.

ENTODONTACEAE

Platygyriella jamaicensis Bartram, sp. nov.

Fig. 5.

Autoica; gracilis, lignicola, caespitosa, caespitibus mollibus, densis, pallide viridibus, nitidiusculis. Caulis repens, fragilis, hic illic sparse sed longe fusco-radiculosus, subpinnatim ramosus, ramis 1–1.5 cm. longis. Folia erecto-patentia, ovato-lanceolata, concava, breviter acuminata, ecostata vel brevissime bicostata, ad 1.4 mm. longa, marginibus integerrimis, superne erectis, inferne anguste recurvis; cellulae lineares, pellucidae, infimae laxiusculae, ad angulos paucae, laxae, subquadratae vel rectangulares, omnes laeves. Folia perichaetialia erecto-patentia, integerrima; seta 4–6 mm. longa, tenuis, laevissima; theca erecta, oblongo-cylindrica, deoperculata ad 1.4 mm. longa, fusca; exostomii dentes subulato-lanceolati, fusci, superne grosse papilloso, inferne transverse striolati; endostomium fuscidulum, corona basilari humili, processibus anguste linearibus, papilloso; operculum conico-rostratum, ad 0.4 mm. longum; sporae 15–20 μ , luteae, minutissime punctulatae.

TYPE: Newmarket, Dec. 12, 1928, C. R. Orcutt 7263.

Although the group of cells at the leaf angles is small, lax, and poorly defined, as contrasted with the distinct group of quadrate alar cells in *P. helicodontoides* Card., the peristome structure is in close accord. As the sporophyte characters are of prime importance in this group I feel that the Jamaican plants may be safely placed here.

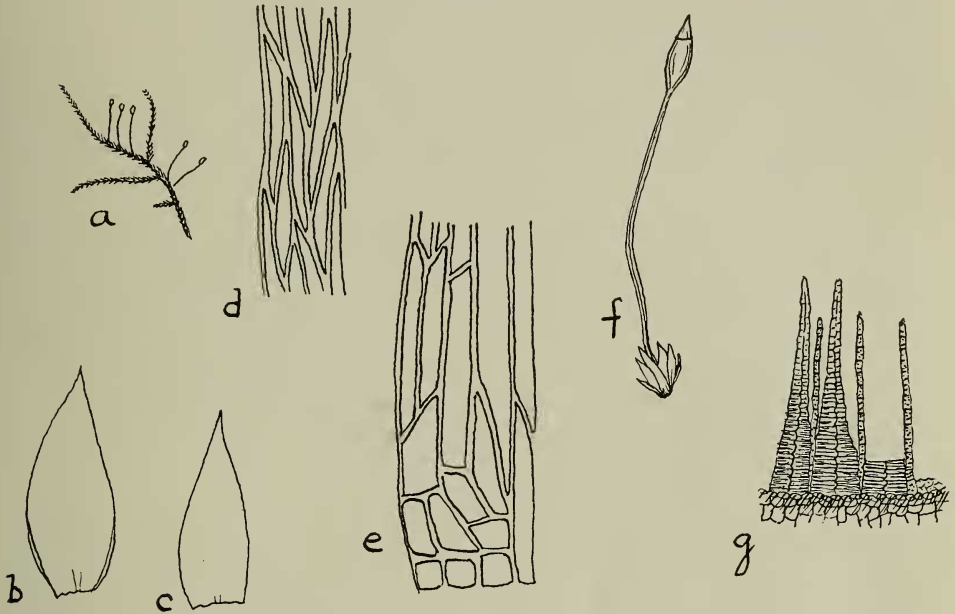


Fig. 5.—*Platygyriella jamaicensis* Bartr., sp. nov.: a, plant $\times 1$; b, c, leaves $\times 30$; d, upper leaf cells and margin $\times 400$; e, basal angle of leaf $\times 400$; f, sporophyte $\times 9$; g, part of peristome $\times 160$.

M. Thériot is in accord with me in thinking that the genera included by Brotherus in the subfamily Pylaisioideae, under Hypnaceae, with the possible exception of *Homomallium*, would find a more congenial resting place in Entodontaceae, between which family and Hypnaceae it evidently occupies a transitional position.

POLYTRICHACEAE

Atrichum angustatum (Brid.) Bry. Eur. var. **Mulleri** (Schp.) Bartr. comb. nov.

Atrichum Mulleri Schp.

Farm Hill, nos. 3367 and 3392; Portland Gap, no. 5413. For remarks on this see the note on page 361 of Honduran Mosses (2).

Oligotrichum erosum (Hampe) Lindb.

Blue Mountain, nos. 2910 and 2911. New to Jamaica.

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ZOOLOGY.—*Some West American sea anemones*.¹ OSKAR CARL-GREN, University of Lund, Sweden. (Communicated by WALDO L. SCHMITT.)

The present paper is based on material collected in California and Washington by Mr. E. F. Ricketts of the Pacific Biological Laboratory, who has long been interested in the Pacific Coast marine invertebrates. Two species taken by Professor T. Gislén, Lund, during a visit to California in 1931 are included. Three species are, I think, not previously described. Instead of the sub-tribe Protostichodactylinae, I have erected a tribe, Corallimorpheae.

Tribe CORALLIMORPHEAE, new name

As I have pointed out previously (1924, p. 180), I cannot agree with the opinion of some authors that the family Corallimorphidae, as well as all other Protostichodactylinae, belong to the Madreporaria. If we place them together, we must suppose that in the Protostichodactylinae the skeleton is lost or never has been developed. The first hypothesis, I think, we can leave out of consideration, because no traces of a skeleton have been found in the Protostichodactylinae, most of which live in shallow water, especially on coral reefs. On the other hand, supposing that the Protostichodactylinae never have been provided with a skeleton, we must consider them as descendants of forms from which the Actinaria, as well as the Madreporaria, have arisen, for the supposition that the Madreporaria originate from the Protostichodactylinae is hardly probable. Moreover, we cannot indicate to which family of Madreporaria the latter group is allied. For my part, I am more inclined to consider the Protostichodactylinae as having developed parallel to the Madreporaria and the Protantheae (s. str.) among the Actinaria having relations to both these groups. Perhaps an order, Corallimorpharia, equal to the Actinaria and Madreporaria, should be erected for the Protostichodactylinae, but for the present I prefer to place them as a group, Corallimorpheae, among the Actinaria. The name Protostichodactylinae is misleading, because on the one hand forms with the tentacles

¹ Received August 15, 1935.